Paul V. Rosasco, P.E.
Engineering Management Support, Inc.
12335 West 53rd Ave. Suite 201
Arvada, Colorado 80002

Dear Mr. Rosasco:

I have reviewed the Draft RI for the West Lake Landfill OU 1. The following comments will be identified by source as they are given. There are some specific comments on technical and procedural issues that The Missouri Department of Natural Resources (MDNR) has provided that will be provided as presented. The comments on the Risk Assessment are provided by the Missouri Department of Health (MDOH). EPA routinely uses MDOH to provide assistance in reviewing Risk Assessments, therefore their comments are to be considered as being EPA's comments. And finally there are some comments from EPA in addition to those by the other reviewers. The comments will be broken into general comments and specific comments. These comments represent those discussed during our September 24, 1998 meeting in the Region VII office.

GENERAL COMMENTS

MDNR reminded EMSI that the document does not bear the seal of a geologist who is registered in the State of Missouri. The document incorporates or is based on a geologic study or on geologic data that had a bearing on conclusions or recommendations reached after January 1, 1997. The Missouri Board of Geologist Registration is charged with the enforcement of the Missouri Geologist Registration Law that includes the requirement that geologic work where public health, safety or welfare are at risk or potentially at risk be completed by or under the supervision of a Missouri registered geologist. The following review comments and/or recommendations by the State of Missouri convey no endorsement as to the validity of the work being completed in accordance with the Missouri Geologist Registration Law or the Board of Geologist Registration. Further the comments and/or recommendations cannot be accepted as being fully completed until the reviewed document is properly sealed/ stamped by a Missouri registered geologist. You stated that Ward Herst would be meeting that requirement for the Remedial Investigation. (MDNR)

As you are aware EPA has not wholly embrased your methodology in evaluating the levels of radiological exposure for the site. EPA's most current information, based upon draft guidance already provided to you, states that risk based decisions are appropriate. That same guidance indicates that 15 millirem per year effective dose equivalent (EDE) is the limit for human exposure. Your evaluations should be based upon this assumption. The only time background should enter into the consideration is when background approaches or exceeds the 15 millirem/yr EDE. The 'reference' levels you have developed is of no value in this evaluation unless it can be equated in some way to the 15 millirem/yr EDE health based standard. Since the dose is additive all calculations should be based upon all the radiologic constituents present. Your agreement to use total Gamma radiation exposure in place of or in addition to the reference levels is adequate. (EPA)

SPECIFIC COMMENTS

Section 1.0 Introduction

No comments.

Section 2.0 Summary of Previous Investigations

MDNR requests a copy of the "Radiological survey of West Lake Landfill, Bridgeton, Missouri, June 4, 1996", by Golder Associates cited in Section 2.5 Landfill Reports. Please send it directly to Jalal El-Jayyousi of MDNR.

Section 3.0 Site Background

There is no indication of the origin of the radionuculide contamination found at the site. It seem that this information is important as part of the site background. It is not necessary to establish 'blame' for the material but its origin is important and relevant. (EPA)

Section 3.3: Examination of figure 3-6 and 6-7 appear to indicate that not all of the contaminated soil on the Ford Property is included in the buffer zone. This discrepancy requires explanation in the document. (EPA, MDNR)

Section 4.0 Site Investigation Activities

Section 4.3 Overland Gamma Survey: It should be noted that the Overland Gamma Survey did not produce a 'bright' line of demarcation for either Area 1 or Area 2. (EPA)

Section 4.3.1: EPA has not accepted the assumptions used in this report. It is inconclusive at best, but it was probably appropriate to use it as a basis of determining the location for the subsequent soil borings. (EPA)

Section 4.3.3: EPA has not concurred with the findings and does not endorse all of the assumptions made by this report. (EPA)

Section 4.4.1: Last bullet page 20. Should the last sentence in this section read "...occurrences did *not* extend below ...." rather than "...occurrences did extend below..."? If not I believe additional explanation to the statements made are required. (EPA)

Section 4.4.2.2: There was some confusion as to the exact number (51, 52 or 60,65, 72 etc.) of borings drilled at Areas 1 and 2. Please modify the text to conclude how many borings were logged and provided data and state something concerning the representativeness of the locations and results. This entire section should be rewritten to make it more 'user friendly'. It is very difficult to determine what was done and how relative that activity was to the characterization of the site from what is presented. (EPA)

Last paragraph, were the samples collected from the eight hand-auger borings submitted for analysis of any kind? (EPA)

Section 4.4.2.3: Paragraph 1. For clarity the location of the five hand-auger borings from which surface samples were taken should be restated. (EPA)

Second paragraph, second bullet. The Ladonda Shale does not exist in the <u>Stratigraphic Succession in Missouri</u>, there is a Lagonda Formation which contains shale. The Lagonda Formation, in the upper portion of the Desmoinesian Series, lies significantly higher in the stratigraphic succession

than the Cheltenham Formation, which is at the base of the Atokan Series. Since several arguments concerning the naturally occurring radiation found in the 'Ladona Shale' were used by McLaren/Hart to justify some of the assumptions made, the actual identification of the material and the radiologic characteristics of the clay will have to be clarified to allow appropriate decision making concerning a variety of issues concerning 'background'. (EPA)

Section 4.4.4: This section and the other similar sections exhibit a tone suggesting that these results are what McLaren/Hart thinks and not necessarily what the RI as a whole is trying to present. You may want to rewrite these sections, making reference to where the text was obtained (i.e. McLaren/Hart), but take ownership as to this is what was found and this is how we interpret it. If EMSI does not agree with a particular interpretation then it should be so stated and an alternative interpretation could be given in its place. In other words the RI should state that data gathered (by whomever) results in the following conclusions.(EPA)

Section 4.4.4.2, first bullet: McLaren/Hart did state that the background was consistent with other Missouri areas, but it must be remembered that no conclusions or background levels have been agreed upon by EPA. (EPA)

Second bullet: It is stated that elevated reading of any kind were not found in boring location WL-105. This seems to contradict the statement made in the third sentence of the same bullet and does contradict the information contained in the sixth bullet of this section. Correction is required. (EPA, MDNR)

Fifth bullet: Should the phrase be "Gasoline constituent" instead of "Gasoline concentration"? (EPA)

Section 4.4.4.5: This section is titled Geotechnical Testing, but basically states that little or no geotechnical testing has taken place, but does contain a lot of information about the erosion from Area 2 and contamination of the Ford property. I would suggest that this section be renamed or that the little about the geotechnical testing be segregated from the other information and that information

be placed in a separate paragraph. (EPA)

Page 38, second paragraph: This paragraph indicates that the surface runoff control measures were successful and one indication of that success is the difficulty McLaren/Hart had in obtaining runoff samples from weirs 5 and 7. This report is not supported by the Mclaren/Hart report of damage to these weirs during the may 1995 storm event. This requires clarification. (MDNR)

4.5: A single table tabulating the wells used and their construction details, such as well depth, screen interval, etc., would be useful for this section. This same list of wells should be used throughout the remainder of the RI/FS. (EPA)

4.5.4, first bullet: Specific explanation of the rational for continuing to use these two wells for background when the detection of radionuclides of concern were reported for both wells should be included. (EPA, MDNR)

4.6.2.1:You may wish to reference figure 4-1 in this section. (EPA)

4.6.4: In the last paragraph and elsewhere the definition and derivation of the term "reference levels" should be provided. Again there has yet to be any agreement from EPA concerning the applicability of this concept and the specific levels that are to be used for this site. (EPA)

4.7.4: Specific statements concerning the reason for including the surface soil sampling results in this section should be included for clarification. This may not be obvious to all reading the document. (EPA)

5.5.1: The inclusion of geologic cross sections across the sites would be helpful in developing conceptual models of the site. Maps depicting the contact between the landfill fill material and underlying alluvial material along with maps depiction the top of bedrock would be useful. (EPA)

5.6.2.2: Some mention of the presence of ground water in the bedrock underlying the alluvium at the site would be

appropriate. (EPA)

5.6.2.3 : Statements concerning the direction of ground water flow, even though modeling efforts do not produce useable information within the area of the landfill, should be included. These can be made on assumptions arrived as a result of the data gathered. (EPA)

5.6.2.4: What method was used for the evaluation of slug test data. You may want to show data curves and analyses in appendix or reference the location that they may be found in other reports. (EPA)

Table 5-3: Include the well number from which each of the hydraulic conductivity values were calculated. What is the significance of the grouping, (i.e. shallow, intermediate, deep?). (EPA)

5.6.2.5: Same comment as with section 5.6.2.3, some assumptions concerning the direction of the ground water flow should be included. (EPA)

Section 6.0 Nature and Extent of Radiological Impacted Materials

General For the purpose of the RI, it would be more appropriate (conservative approach) to delineate areas of potentially impacted soils by a comparison of all radionuclides as absolute measurements relative to risk, in leu of reference levels. The reference levels used have not been accepted by EPA, nor has the issue of background levels been resolved. As I stated in my letter in November of 1997 the use of risk based parameters would be more appropriate as stated in the draft guidance enclosed with that letter. As we agreed in our September 24, 1998 meeting the use of reference levels will be supplemented or replaced by 'total gamma' data. The following comments relate to the document as received.(EPA)

6.2: The MDNR and EPA have both expressed concern with the use of reference levels and the method utilized for determining background. Although this section states that the background levels calculated by McLaren/Hart compare well with the results obtained by other studies in Missouri, this does not seem to be the case for calculating the background gamma exposure rate. The background gamma level

calculated for the West Lake Landfill is 45 to 94% higher than the background levels calculated for other sites. Using the mean plus two times the standard deviation as a background value is not conservative. The use of 40 CFR 192 should be considered in light of the draft guidance previously referenced. (MDNR, EPA)

6.3: Risk for radionuclides is additive therefore risk should be based upon the total of all radionuclides present and according to the guidance greater than 15 millirem per year effective dose equivalent (EDE) is unacceptable for human health. (EPA)

6.4.2: 3rd paragraph - What is defined as "elevated downhole gamma levels"? (EPA)

6.5.1:You may want to include a comparison of Figures 4-4 through 4-8 to Figures 6-1 and 6-2. (EPA)

6.5.1: The use of the word "significant" is confusing, were there other samples with radionuclides above reference or background levels detected. (EPA)

5th paragraph: You may want to include that radionuclides were detected at boring location WL-231, but not above reference levels. (EPA)

Fifth paragraph, last sentence: Should this be deeper than 3 ft. instead of shallower, or was elevated gamma reading detected at depth? (EPA)

6.5.2, 1st paragraph: Same comment as in section 6.5.1 with respect to the word "significant". (EPA)

last paragraph: The average thickness 3.6 ft. seams low in comparison with the depth intervals reported in the previous paragraphs. (EPA)

6.6, last sentence: Should this be deeper than 3 ft. instead of shallower, or was elevated gamma reading detected at depth? (EPA)

Section 7.0 Contaminant Extent, Fate and Transport

7.1.1.2: The use of the term extremely windy may be inappropriate. Based upon the Beaufort Scale for wind evaluation, wind speeds in the range of 13-18 mph are described as a moderate breeze and winds on the order of 19-24 mph are described as a fresh breeze. (EPA)
last paragraph: You may want to include the text "based upon this one sampling event" EMSI concludes that.... (EPA)

7.1.2.1: This section makes reference to the second possible pathway by which radionuclides could migrate offsite, what was the first? (EPA)

Was the same suite of radionuclides analyses performed on weir samples collected from Area 1, performed on the samples from Area 2? Hard to follow in the text. (EPA)

You may want to include reference to Figure 4-1 in this section. (EPA)

7.1.2.2, last paragraph: The inclusion of the word "suspended" seems contradictory to the conclusions presented in the end of this paragraph and with the conclusions previously presented in the last paragraph of section 7.1.2.1. (EPA)

7.1.3.1: Why not compare sediment sample results to background soil sample results instead of reference levels. (EPA)

7.1.3.1.1: You may want to include reference to Figure 4-1 in this section. (EPA)

7.1.3.1.2: You may want to include reference to Figure 4-1 in this section. (EPA)

7.1.4.2: You should include additional text in the conclusion portion of this section with respect to uncertainties associated with the high MDA levels. (EPA)

7.1.4.3: What are the relative solubilities of uranium and thorium isotopes with respect to radium? Are solubilities and thus the potential for migration through the ground water pathway diminishing. (EPA)

Section 8.0 Non-Radiological Chemical Occurrences in Areas 1 & 2

General: Tables presenting the range of concentrations detected, sample location of maximum concentration, and frequency of detection would be helpful. (EPA)

More detailed discussions as to the spacial distribution of contaminants detected should be included in each of the appropriate subsections, i.e. elevated metals concentrations in Area 2 were observed primarily in the west-central portion of the area, etc.. (EPA)

Section 9.0 - Baseline Risk Assessment

MDOH disagreed with some of the basic assumptions made in this assessment and the input exposure parameters used. MDOH offered the following comments which were discussed during our September 24, 1998 meeting. Pam Holley of the Missouri Department of Health (MDOH) will be in direct contact with your risk assessor to follow up on any of the issues which require additional clarification. Each of the comments below were discussed and agreement reached between the two on the appropriate resolution. I am forwarding the comments only as a reminder of the specific items discussed. I feel assured that the conclusions reached between the two will be satisfactory to the state, EPA and the PRPs.

The use of Region 3 screening values is not recommended due to errors in the values. EPA has requested that the Region 3 tables not be used in risk assessments.

In Section A.3.1.8.2, future land use is discussed. It is assumed that due to the deed restrictions that future exposure at the site will be the same as current exposure. This may not be the case. Although some development may be restricted, occupational activities and exposures may change. Currently, according to the text, there is little access to the site for workers. However, worker exposure could increase in the future if the site is remediated to "safe" occupational levels, levels based on the minimal current occupational exposure. Construction and building installation in the area immediately surrounding Areas 1 and 2 is not restricted. These adjacent areas could be

occupationally developed in the future and Areas 1 and 2 could be included in this usage without buildings being built, for example as equipment storage areas or as recreational grounds for employees. There is no method to restrict the type and magnitude of occupational exposure, therefore, any assessment of future risk should include a reasonable maximum exposure to occupational workers. The exposure frequency presented in Section A.3.2.5 of one day per year for a groundskeeper is too low. Please indicate any documentation that all the grounds are currently only mowed once per year. The future exposure frequency can be realistically expected to be greater than one day per year due to possible future activities such as adjacent industrial or on-site storage, etc.

The default value of 0.001 used for dermal absorption is referenced to EPA (1995). The revised 1997 dermal guidance from EPA recommends a value of 0.01 be used for a default for inorganics. This should be corrected.

Many of the exposure variables are non-standard and relatively low. The default exposure duration for the groundskeeper scenario should be 25 years, not 6.6 years. The exposure frequency for the groundskeeper at all areas should be 26 days per year. The exposure time for the groundskeeper at all areas should be 8 hours per day. The standard EPA ingestion rate for a groundskeeper is 0.48 grams per day, not 0.1 grams per day as stated.

The fraction of ingestion should be 100% for the groundskeeper. The groundskeeper is assumed by EPA to receive the bulk of the 480 mg of soil (EPA default) ingested to be at work during his job as groundskeeper.

The adherence factor used in this assessment, 0.007 mg/cm2, is extremely non-conservative. The referenced document presents several options. Historically EPA has defaulted with an adherence factor of 1.0. The use of this lower value may significantly underestimate the risk to those exposed.

In general, this assessment used selective non-conservative numerical inputs and assumptions that significantly underestimates the risk to those exposed both currently and in the future. The use of these lower variables reduces the

calculated risk from this site by as much as five significant digits or more, as compared to the use of EPA future default values. That level of possible underestimation in a risk assessment is not acceptable. MDOH also requests that a future full-time occupational scenario be included using EPA default variables to be protective of future public health. (MDOH)

Section 10.0 Summary and Conclusions

10.1.2, 8th paragraph: This statement seems to indicate that the piezometric surface underlying the site is primarily a planer feature tilted in one direction, which is misleading. (EPA)

10.3.1: You may not want to eliminate fugitive dust as a major migrations pathway based solely upon the results of one relatively inconclusive sampling event. (EPA)

In summation significant work is required to rework this document into a form that can be used to identify risk based exposure. My letter in November of 1997 was intended to clearly state this message, apparently I failed to do so then. I hope that I have now done so.

If you have any questions do not hesitate to contact me. I may be reached by telephone at (913) 551-7728 or by e-mail at kinser.steven@epamail.epa.gov .

Sincerely yours,

Steven E. Kinser R.G.
Remedial Project Manager
Missouri-Kansas Remedial Branch
Superfund Division

cc: Michael D. Hockley, Esq.
Spencer Fane Britt & Browne
1400 commerce Bank Building
1000 Walnut Street
Kansas City, Missouri 64106-2140

Jalal El-Jayyousi, MDNR

Pam Holley, MDOH

bcc: David Hoefer, CNSL